

**Notice of Allowability**

Application No.

10/622,522

Applicant(s)

OJARD ET AL.

Examiner

Art Unit

Charles Chow

2685

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--*

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1.  This communication is responsive to 7/18/2004.
2.  The allowed claim(s) is/are 1-5.
3.  The drawings filed on 18 July 2003 are accepted by the Examiner.
4.  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some\*    c)  None    of the:
  1.  Certified copies of the priority documents have been received.
  2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3.  Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5.  A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6.  CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
  - (a)  including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached  
1)  hereto or 2)  to Paper No./Mail Date \_\_\_\_.
  - (b)  including changes required by the attached Examiner's Amendment / Comment or in the Office action of  
Paper No./Mail Date \_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7.  DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1.  Notice of References Cited (PTO-892)
2.  Notice of Draftperson's Patent Drawing Review (PTO-948)
3.  Information Disclosure Statements (PTO-1449 or PTO/SB/08),  
Paper No./Mail Date 7/13/2003
4.  Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5.  Notice of Informal Patent Application (PTO-152)
6.  Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_.
7.  Examiner's Amendment/Comment
8.  Examiner's Statement of Reasons for Allowance
9.  Other \_\_\_\_.

### Detailed Action

#### *Allowable Subject Matter*

1. Claims 1-5 are allowable over the prior art of record.

This application case has allowable parent case 09/585,774 which is US Patent 6,625,459 B1.

Claim 1 in this application is different from the claims in parent case (US 6,625,459) by having the **4-QAM, QPSK or carrier amplitude modulation/phase modulation constellation.**

The following is the examiner's statement for the reasons of allowance:

Claims 1-5 are allowable over the prior art of record because the cited references fails to disclose singly, particularly, or in combination, the subject matter for a single carrier propagated signal comprising a preamble segment having a periodic plurality of preamble sequences, each preamble sequence containing **16-bit symbols generated in accordance with  $1/32 \sum b_k b^*_{mod(k+n, 16)} = \{1, n=0 \text{ or } 0 \neq 0\}$ ; the 16-bit symbols belonging to a 4-quadrature amplitude modulation constellation QAM, a quadrature phase shifted keying modulation constellation QPSK, or a carrierless amplitude modulation/phase modulation constellation CAP**; and a data segment appended to the preamble, the single carrier propagated signal being transmittable from a transmitter to a receiver over a communication channel.

The closes prior arts from **Bjork et al.** (US 6,084,862) and **Mueller** (US5,450,456) fail to teach the 16-bit preamble sequence  $b_k$ , according to the equation  $1/32 \sum b_k b^*_{mod(k+n, 16)} = \{1, n=0 \text{ or } 0 \neq 0\}$ , belonging to 4-QAM, QPSK or CAP constellation; the data segment appended to the preamble.. **Langberg et al.** (US 5,852,603) teaches 4-CAP, N-CAP training

sequence, but fails to teach the 16-bit sequence from equation,  $1/32 \sum b_k b^*_{\text{mod}(k+n, 16)} = \{1, n=0 \text{ or } 0 \text{ } n \neq 0\}$ .

**Bjork et al.** (US 6,084,862) teaches the transmitting training sequence for synchronizing receiver (Fig. 2, Fig. 3, col. 3, lines 37-39; col. 5, lines 41-67; col. 5, lines 50-57), the processing of the received training sequence signal to determine from the received signal a channel estimate in accordance with:  $\hat{h} = (S^H S)^{-1} S^H y$  (col. 7, line 5 to col. 8, line 51;  $\hat{h}$  is the derived channel model for channel estimate, the  $S$  is the known training sequence, and the  $y$  is the received training samples sequence in col. 7, line 43-67), the  $B = (S^H S)^{-1} S^H$  and  $B^H = S(S^H S)^{-1}$ , used in the channel model estimation (col. 13, lines 1-24).

**Muller** (US5,450,456) teaches the measuring of the carrier frequency by transmitting a preamble test sequence for correct the oscillator frequency in the coded orthogonal FDM system (col. 2, lines 64-68), the constant amplitude zero autocorrelation sequence CAZAC for controlling of the time/frequency and phase of the transmitted symbols (col. 4, lines 1-17). The finite sequence  $x_i$  is shown in equation (4) (col. 4, lines 18-60) with the repeated four-value CAZAC sequences, the mod  $M$  preamble sequences  $x_i$  for deriving the frequency deviation such that the transmitter and receiver could match the carrier frequency precisely (col. 2, lines 52-61).

**Langberg et al.** (US 5,852,630) teaches the transmitting of the training sequence to train equalizer with channel parameters of the DSL communication channel (abstract, Fig. 1), the **transmitting of 4-CAP, N-CAP training sequences** to train the equalizer 48 of the communication channel (col. 7, line 56 to col. 8, line 25). Langberg et al. fail to teach the above allowable features.

**Raphaeli et al.** (US 6,616,254 B1) teaches the **transmitting of the preamble sequence with, differentially coded shift key, onto the AC power line communication channel link (abstract, col.. 2, lines 33-39), the preamble sequences (Fig. 1-4) with appended data 14 (Fig. 3).**

**Scridhar et al.** (US 5,347,539) teaches the two wire telephone line modem communication, and estimating channel characteristics (abstract, Fig. 1-2), the **probing of the channel characteristics of the telephone line** (col. 6, line 60 to col. 7, line 11).

**John C. L. Ng et al.** (IEEE 0900-6778/98, title – Complex optimal sequences with constant magnitude for fast channel estimation initialization) teaches the sounding sequences  $\{b_k\}$  for estimating channel characteristics (abstract, equation (2) in section II channel estimation with optimal sequence).

**Bar-David et al.** (US 6,459,728) teaches the estimating channel impulse response using correlative channel sounding having 16 bits  $b(k)$  in transmitted 26 bits training sequence (abstract, col. 3, lines 1-49, Fig. 2-3).

Other prior art are considered, they fail to teach the above claimed features.

**Sriram** (US 6,331,976 B1) teaches the packed data transmitted from T/R transmitter 10 to receivers RVCR1-N (Fig. 1-3, abstract, col. 3, lines 57-65). The packed data comprises the preamble bit 16-64 bits and the synchronization word, followed by user data (Fig. 3, col. 5, lines 5-12, col. 5, line 64; col. 15, line 54 to col. 16, lines 42), for matching the sample vector 34 of the preamble bit stream to the bit sequence  $b_1-b_m$ , equation 4, col. 15, line 63).

**Pukkila et al.** (6,418,175 B1) teaches the training sequences for channel estimation, the 16-bit GSM training sequence 1-2 (abstract, Fig. 1-4, and col. 4, line 49 to col. 5, line 37).

Any comments considered necessary by applicant must be submitter no later than the payment of the issue fee, and to avoid processing delays, should preferably accompany the issue fee. Such submission should be clearly labeled "comments on statement of reasons for allowance".

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (703)-306-5615.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (703)-305-4385.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Charles Chow C.C.

January 4, 2005.



EDWARD F. URBAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600